

New Media/Fall

ABSTRACT

QR codes are becoming an integral part of our growing digital lifestyle. Through the course of our research, we will analyze how the physical presence of a hypermedia label affects the length of time viewers examine public art on campus. In the first phase, we will measure the number of people who stop to view a sample of art exhibits on the UNC Asheville campus without QR code labels as well as the time each person spends examining the art. After this, we will create a database driven application the viewer can access from the QR code. This application will serve all the information associated with the art. After the application has been developed and tested, we will install the QR codes on the sample of art exhibits. We will then measure the difference, if any, in the number of viewers and the amount of time each viewer observes the exhibits.

A large hurdle will be how to monitor viewer observation time before and after the placement of the codes. Prior to installing the codes, we will measure the number of viewers that stop to examine art by the use of a micro-controller and a webcam. The webcam will be set up with motion-detection software that will take a picture every time it senses motion. However, the images we collect will only be used in the aggregate calculations. After the codes have been installed and in place for a substantial period of time, we will use the micro-controller/webcam setup to measure the difference, if any, in the number of people that view the exhibits. In addition, we will investigate the QR code's effect on the length of time spent observing the art piece. Viewers' comments will be collected about the effectiveness of the QR codes, and we will assess their qualitative value.

We will be exploring how the usability of the QR code interface affects the viewer's behavior toward the art. With this proof of concept, other students or staff will be able to add to this system as they wish, creating a growing network of scannable information on the UNC Asheville campus.

// notes

Webcam motion detection software: (<http://www.ispyconnect.com/>)

Simple webcams from Amazon (http://www.amazon.com/Webcam-Camera-Vision-Meeting-compatible/dp/B0015TJNEY/ref=sr_1_1?ie=UTF8&qid=1346709812&sr=8-1&keywords=webcam)

microcontrollers from Farnell (http://uk.farnell.com/jsp/bespoke/bespoke7.jsp?ICID=I-RASP-HPBLOF-0015&bespokepage=farnell/en_UK/promotions/RaspberryPi.jsp)

DESCRIPTION OF RESEARCH

The permanent art exhibits on the UNC Asheville campus are not always labeled well, which might negatively affect how students and campus guests “use” the art (that is, observe and interact with it). We are interested to see how placement of QR codes alters this perception. Once a control is established with no QR codes, we will produce a database driven website, along with prototypes of the QR codes, with both products working in tandem in the next phase of the project. Once all the signage is placed, we will collect more data, analyze, and present our findings.

Our research study will begin by installing micro-controllers and cameras at ten different locations where permanent art is located, which will collect data from each site over three to five weeks. These observations will be used to find the number of visitors to installations and the lengths of time spent at each installation. Since our project relies on a large amount of data, cameras are the only feasible way to collect the necessary volume of information needed for the next step of the project. Once this information is collected (over a period of three to five weeks to provide a control group), we will work with the compiled data to design QR codes that will make specific information about each art piece accessible to visitors through their smart phones and other reading devices. After a period of two to four weeks later, we will reinstall the micro-controllers and cameras to study how effective the new information distribution channels are with visitors. We will give careful consideration to the design of the QR codes, since the “usability” of the artwork depends on the design and usability of the codes. As

Jef Raskin says, “[c]reating an interface is much like building a house: if you don't get the foundation right, no amount of decorating can fix the resulting structure,” (xi).

By studying the number of viewers and their viewing times before QR codes are added, we hope to determine which areas in each particular display shows the most interest to those viewing the installations. After analyzing the data delivered through the micro-controllers and cameras, we hope to give more detailed information to each visitor to encourage viewing and interacting with art installations. When the monitoring equipment is reinstalled after the QR codes have been added at a later date, we will then examine how effective these links to additional information are by studying the number of visitations and the duration of each visit. This system will allow us to customize each QR code based on the information we receive and analyze from each site, which is important because “[a]s design moves to implementation, the choice of user interface building tools is vital to success,” (Shneiderman 98).

In terms of campus support, we have met with Luke Withrow, the campus Webmaster, and received his approval, as well as interest and support from Wayfinding Committee spokesperson David Todd. This project will be extremely cost effective, especially given the repurposing of the majority of equipment through our departments once our work is completed. The total cost of this project is just around \$550, but again, it is important to note that this investment will continue to reap benefits within our institution long after the initial project is complete.

This project presents an opportunity to fully utilize and enhance the viewing experiences of permanent art installations on campus by tailoring specific information to visitors through the use of QR codes in order to enhance each experience. In addition, we plan to present our work during the campus’s fall or spring symposium so that our work might be utilized within other areas of the university.

TIME PERIOD

Weeks 1-3:

- Apply for grants, creating budget
- Purchase micro-controllers and cameras for surveillance before/after QR code placement
- Preliminary research on campus, including style of signage, current art exhibits, etc
- Meeting with Wayfinding Committee to get project approval

Weeks 4-6:

- Create prototypes of QR codes, presenting to Wayfinding Committee
- Place micro-controllers and cameras around campus to monitor the current interest in art on campus, reviewing data
- Preliminary creation of the database-driven website

Weeks 7-9:

- Finalize design and creation of the QR codes
- Begin placement of the QR codes around campus
- Deploy working prototype of database-driven website

Weeks 10-12:

- Continue monitoring of micro-controllers and camera information
- Continue working on the website, update art information

Weeks 13-15:

- Final review of camera information and website
- Final meeting with Wayfinding Committee
- Breakdown of any unnecessary items, QR codes, signage, etc

Week 16:

- Review final information
- Prepare to present at conferences and research fairs

BUDGET WITH JUSTIFICATION

- Raspberry Pi microcontrollers (for use with cameras), 10 at \$35 each = \$350
- Simple cameras (for video recording), 10 at \$3.75 = \$37.50

- Sheet metal (copper, bronze, or aluminum) = \$100.00
- Vinyl sheeting (for QR code creation) = \$25.00
- End Mills (for QR code creation) = \$50.00
- Total = \$562.5

PUBLICATION OUTLET

We will apply to present at least at two off-campus Undergraduate Research venues: NCUR, BIGSURS or COPLAC; in addition to presenting during the fall or spring UNC Asheville symposium.

WORKS CITED

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